



033072-026.ST25

SEQUENCE LISTING

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Barak, Lawrence S.
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Caron, Marc G.

<120> Modified G-Protein Coupled Receptors

<130> 033072-026

<140> US 09/993,844

<141> 2001-11-05

<150> US 60/245,772

<151> 2000-11-03

<150> US 60/260,363

<151> 2001-01-08

<160> 82

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 371

<212> PRT

<213> Artificial Sequence

<220>

<223> amino acid sequence of wild-type V2R

<400> 1

Met	Leu	Met	Ala	Ser	Thr	Thr	Ser	Ala	Val	Pro	Gly	His	Pro	Ser	Leu
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Pro	Ser	Leu	Pro	Ser	Asn	Ser	Ser	Gln	Glu	Arg	Pro	Leu	Asp	Thr	Arg
			20					25					30		
Asp	Pro	Leu	Leu	Ala	Arg	Ala	Glu	Leu	Ala	Leu	Leu	Ser	Ile	Val	Phe
		35					40					45			
Val	Ala	Val	Ala	Leu	Ser	Asn	Gly	Leu	Val	Leu	Ala	Ala	Leu	Ala	Arg
	50					55				60					
Arg	Gly	Arg	Arg	Gly	His	Trp	Ala	Pro	Ile	His	Val	Phe	Ile	Gly	His
65					70					75				80	
Leu	Cys	Leu	Ala	Asp	Leu	Ala	Val	Ala	Leu	Phe	Gln	Val	Leu	Pro	Gln
				85					90					95	
Leu	Ala	Trp	Lys	Ala	Thr	Asp	Arg	Phe	Arg	Gly	Pro	Asp	Ala	Leu	Cys
			100					105					110		
Arg	Ala	Val	Lys	Tyr	Leu	Gln	Met	Val	Gly	Met	Tyr	Ala	Ser	Ser	Tyr
		115					120					125			
Met	Ile	Leu	Ala	Met	Thr	Leu	Asp	Arg	His	Arg	Ala	Ile	Cys	Arg	Pro
	130					135					140				
Met	Leu	Ala	Tyr	Arg	His	Gly	Ser	Gly	Ala	His	Trp	Asn	Arg	Pro	Val
145					150					155				160	
Leu	Val	Ala	Trp	Ala	Phe	Ser	Leu	Leu	Leu	Ser	Leu	Pro	Gln	Leu	Phe
				165					170					175	

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Ile Phe Ala Gln Arg Asn Val Glu Gly Gly Ser Gly Val Thr Asp Cys
      180      185      190
Trp Ala Cys Phe Ala Glu Pro Trp Gly Arg Arg Thr Tyr Val Thr Trp
      195      200      205
Ile Ala Leu Met Val Phe Val Ala Pro Thr Leu Gly Ile Ala Ala Cys
      210      215      220
Gln Val Leu Ile Phe Arg Glu Ile His Ala Ser Leu Val Pro Gly Pro
      225      230      235      240
Ser Glu Arg Pro Gly Gly Arg Arg Arg Gly Arg Arg Thr Gly Ser Pro
      245      250      255
Gly Glu Gly Ala His Val Ser Ala Ala Val Ala Lys Thr Val Arg Met
      260      265      270
Thr Leu Val Ile Val Val Val Tyr Val Leu Cys Trp Ala Pro Phe Phe
      275      280      285
Leu Val Gln Leu Trp Ala Ala Trp Asp Pro Glu Ala Pro Leu Glu Gly
      290      295      300
Ala Pro Phe Val Leu Leu Met Leu Leu Ala Ser Leu Asn Ser Cys Thr
      305      310      315      320
Asn Pro Trp Ile Tyr Ala Ser Phe Ser Ser Ser Val Ser Ser Glu Leu
      325      330      335
Arg Ser Leu Leu Cys Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly
      340      345      350
Pro Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp
      355      360      365
Thr Ser Ser
      370

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<210> 2

<211> 413

<212> PRT

<213> Artificial Sequence

<220>

<223> amino acid sequence of wild-type beta2AR

<400> 2

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Met Gly Gln Pro Gly Asn Gly Ser Ala Phe Leu Leu Ala Pro Asn Arg
  1      5      10      15
Ser His Ala Pro Asp His Asp Val Thr Gln Gln Arg Asp Glu Val Trp
      20      25      30
Val Val Gly Met Gly Ile Val Met Ser Leu Ile Val Leu Ala Ile Val
      35      40      45
Phe Gly Asn Val Leu Val Ile Thr Ala Ile Ala Lys Phe Glu Arg Leu
      50      55      60
Gln Thr Val Thr Asn Tyr Phe Ile Thr Ser Leu Ala Cys Ala Asp Leu
      65      70      75      80
Val Met Gly Leu Ala Val Val Pro Phe Gly Ala Ala His Ile Leu Met
      85      90      95
Lys Met Trp Thr Phe Gly Asn Phe Trp Cys Glu Phe Trp Thr Ser Ile
      100      105      110
Asp Val Leu Cys Val Thr Ala Ser Ile Glu Thr Leu Cys Val Ile Ala
      115      120      125
Val Asp Arg Tyr Phe Ala Ile Thr Ser Pro Phe Lys Tyr Gln Ser Leu
      130      135      140
Leu Thr Lys Asn Lys Ala Arg Val Ile Ile Leu Met Val Trp Ile Val
      145      150      155      160

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Ser Gly Leu Thr Ser Phe Leu Pro Ile Gln Met His Trp Tyr Arg Ala
      165      170      175
Thr His Gln Glu Ala Ile Asn Cys Tyr Ala Asn Glu Thr Cys Cys Asp
      180      185      190
Phe Phe Thr Asn Gln Ala Tyr Ala Ile Ala Ser Ser Ile Val Ser Phe
      195      200      205
Tyr Val Pro Leu Val Ile Met Val Phe Val Tyr Ser Arg Val Phe Gln
      210      215      220
Glu Ala Lys Arg Gln Leu Gln Lys Ile Asp Lys Ser Glu Gly Arg Phe
      225      230      235      240
His Val Gln Asn Leu Ser Gln Val Glu Gln Asp Gly Arg Thr Gly His
      245      250      255
Gly Leu Arg Arg Ser Ser Lys Phe Cys Leu Lys Glu His Lys Ala Leu
      260      265      270
Lys Thr Leu Gly Ile Ile Met Gly Thr Phe Thr Leu Cys Trp Leu Pro
      275      280      285
Phe Phe Ile Val Asn Ile Val His Val Ile Gln Asp Asn Leu Ile Arg
      290      295      300
Lys Glu Val Tyr Ile Leu Leu Asn Trp Ile Gly Tyr Val Asn Ser Gly
      305      310      315      320
Phe Asn Pro Leu Ile Tyr Cys Arg Ser Pro Asp Phe Arg Ile Ala Phe
      325      330      335
Gln Glu Leu Leu Cys Leu Arg Arg Ser Ser Leu Lys Ala Tyr Gly Asn
      340      345      350
Gly Tyr Ser Ser Asn Gly Asn Thr Gly Glu Gln Ser Gly Tyr His Val
      355      360      365
Glu Gln Glu Lys Glu Asn Lys Leu Leu Cys Glu Asp Leu Pro Gly Thr
      370      375      380
Glu Asp Phe Val Gly His Gln Gly Thr Val Pro Ser Asp Asn Ile Asp
      385      390      395      400
Ser Gln Gly Arg Asn Cys Ser Thr Asn Asp Ser Leu Leu
      405      410

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<210> 3

<211> 370

<212> PRT

<213> Artificial Sequence

<220>

<223> amino acid sequence of beta2-AR-V2R chimera

<400> 3

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Met Gly Gln Pro Gly Asn Gly Ser Ala Phe Leu Leu Ala Pro Asn Arg
  1      5      10      15
Ser His Ala Pro Asp His Asp Val Thr Gln Gln Arg Asp Glu Val Trp
      20      25      30
Val Val Gly Met Gly Ile Val Met Ser Leu Ile Val Leu Ala Ile Val
      35      40      45
Phe Gly Asn Val Leu Val Ile Thr Ala Ile Ala Lys Phe Glu Arg Leu
      50      55      60
Gln Thr Val Thr Asn Tyr Phe Ile Thr Ser Leu Ala Cys Ala Asp Leu
      65      70      75      80
Val Met Gly Leu Ala Val Val Pro Phe Gly Ala Ala His Ile Leu Met
      85      90      95
Lys Met Trp Thr Phe Gly Asn Phe Trp Cys Glu Phe Trp Thr Ser Ile
      100      105      110

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Asp Val Leu Cys Val Thr Ala Ser Ile Glu Thr Leu Cys Val Ile Ala
115 120 125
Val Asp Arg Tyr Phe Ala Ile Thr Ser Pro Phe Lys Tyr Gln Ser Leu
130 135 140
Leu Thr Lys Asn Lys Ala Arg Val Ile Ile Leu Met Val Trp Ile Val
145 150 155 160
Ser Gly Leu Thr Ser Phe Leu Pro Ile Gln Met His Trp Tyr Arg Ala
165 170 175
Thr His Gln Glu Ala Ile Asn Cys Tyr Ala Asn Glu Thr Cys Cys Asp
180 185 190
Phe Phe Thr Asn Gln Ala Tyr Ala Ile Ala Ser Ser Ile Val Ser Phe
195 200 205
Tyr Val Pro Leu Val Ile Met Val Phe Val Tyr Ser Arg Val Phe Gln
210 215 220
Glu Ala Lys Arg Gln Leu Gln Lys Ile Asp Lys Ser Glu Gly Arg Phe
225 230 235 240
His Val Gln Asn Leu Ser Gln Val Glu Gln Asp Gly Arg Thr Gly His
245 250 255
Gly Leu Arg Arg Ser Ser Lys Phe Cys Leu Lys Glu His Lys Ala Leu
260 265 270
Lys Thr Leu Gly Ile Ile Met Gly Thr Phe Thr Leu Cys Trp Leu Pro
275 280 285
Phe Phe Ile Val Asn Ile Val His Val Ile Gln Asp Asn Leu Ile Arg
290 295 300
Lys Glu Val Tyr Ile Leu Leu Asn Trp Ile Gly Tyr Val Asn Ser Gly
305 310 315 320
Phe Asn Pro Leu Ile Tyr Cys Arg Ser Pro Asp Phe Arg Ile Ala Phe
325 330 335
Gln Glu Leu Leu Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro
340 345 350
Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Thr
355 360 365
Ser Ser
370

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<210> 4

<211> 382

<212> PRT

<213> Artificial Sequence

<220>

<223> amino acid sequence of MOR-V2R chimera expressed
from the pEArrB-1/MOR vector

<400> 4

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Met Asp Ser Ser Thr Gly Pro Gly Asn Thr Ser Asp Cys Ser Asp Pro
1 5 10 15
Leu Ala Gln Ala Ser Cys Ser Pro Ala Pro Gly Ser Trp Leu Asn Leu
20 25 30
Ser His Val Asp Gly Asn Gln Ser Asp Pro Cys Gly Leu Asn Arg Thr
35 40 45
Gly Leu Gly Gly Asn Asp Ser Leu Cys Pro Gln Thr Gly Ser Pro Ser
50 55 60
Met Val Thr Ala Ile Thr Ile Met Ala Leu Tyr Ser Ile Val Cys Val
65 70 75 80
Val Gly Leu Phe Gly Asn Phe Leu Val Met Tyr Val Ile Val Arg Tyr

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```

      85              90              95
Thr Lys Met Lys Thr Ala Thr Asn Ile Tyr Ile Phe Asn Leu Ala Leu
      100              105              110
Ala Asp Ala Leu Ala Thr Ser Thr Leu Pro Phe Gln Ser Val Asn Tyr
      115              120              125
Leu Met Gly Thr Trp Pro Phe Gly Thr Ile Leu Cys Lys Ile Val Ile
      130              135              140
Ser Ile Asp Tyr Tyr Asn Met Phe Thr Ser Ile Phe Thr Leu Cys Thr
      145              150              155              160
Met Ser Val Asp Arg Tyr Ile Ala Val Cys His Pro Val Lys Ala Leu
      165              170              175
Asp Phe Arg Thr Pro Arg Asn Ala Lys Ile Val Asn Val Cys Asn Trp
      180              185              190
Ile Leu Ser Ser Ala Ile Gly Leu Pro Val Met Phe Met Ala Thr Thr
      195              200              205
Lys Tyr Arg Gln Gly Ser Ile Asp Cys Thr Leu Thr Phe Ser His Pro
      210              215              220
Thr Trp Tyr Trp Glu Asn Leu Leu Lys Ile Cys Val Phe Ile Phe Ala
      225              230              235              240
Phe Ile Met Pro Ile Leu Ile Ile Thr Val Cys Tyr Gly Leu Met Ile
      245              250              255
Leu Arg Leu Lys Ser Val Arg Met Leu Ser Gly Ser Lys Glu Lys Asp
      260              265              270
Arg Asn Leu Arg Arg Ile Thr Arg Met Val Leu Val Val Ala Val
      275              280              285
Phe Ile Val Cys Trp Thr Pro Ile His Ile Tyr Val Ile Ile Lys Ala
      290              295              300
Leu Ile Thr Ile Pro Glu Thr Thr Phe Gln Thr Val Ser Trp His Phe
      305              310              315              320
Cys Ile Ala Leu Gly Tyr Thr Asn Ser Cys Leu Asn Pro Val Leu Tyr
      325              330              335
Ala Phe Leu Asp Glu Asn Phe Lys Arg Cys Phe Arg Glu Phe Cys Ala
      340              345              350
Ala Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser
      355              360              365
Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser
      370              375              380

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<210> 5

<211> 382

<212> PRT

<213> Artificial Sequence

<220>

<223> amino acid sequence of D1AR-V2R chimera expressed
from the pEArrB-1/D1AR vector

<400> 5

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Met Ala Pro Asn Thr Ser Thr Met Asp Glu Ala Gly Leu Pro Ala Glu
  1              5              10              15
Arg Asp Phe Ser Phe Arg Ile Leu Thr Ala Cys Phe Leu Ser Leu Leu
      20              25              30
Ile Leu Ser Thr Leu Leu Gly Asn Thr Leu Val Cys Ala Ala Val Ile
      35              40              45
Arg Phe Arg His Leu Arg Ser Lys Val Thr Asn Phe Phe Val Ile Ser
      50              55              60

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Leu Ala Val Ser Asp Leu Leu Val Ala Val Leu Val Met Pro Trp Lys
65          70          75          80
Ala Val Ala Glu Ile Ala Gly Phe Trp Pro Phe Gly Ser Phe Cys Asn
85          90          95
Ile Trp Val Ala Phe Asp Ile Met Cys Ser Thr Ala Ser Ile Leu Asn
100         105         110
Leu Cys Val Ile Ser Val Asp Arg Tyr Trp Ala Ile Ser Ser Pro Phe
115         120         125
Gln Tyr Glu Arg Lys Met Thr Pro Lys Ala Ala Phe Ile Leu Ile Ser
130         135         140
Val Ala Trp Thr Leu Ser Val Leu Ile Ser Phe Ile Pro Val Gln Leu
145         150         155         160
Ser Trp His Lys Ala Lys Pro Thr Trp Pro Leu Asp Gly Asn Phe Thr
165         170         175
Ser Leu Glu Asp Thr Glu Asp Asp Asn Cys Asp Thr Arg Leu Ser Arg
180         185         190
Thr Tyr Ala Ile Ser Ser Ser Leu Ile Ser Phe Tyr Ile Pro Val Ala
195         200         205
Ile Met Ile Val Thr Tyr Thr Ser Ile Tyr Arg Ile Ala Gln Lys Gln
210         215         220
Ile Arg Arg Ile Ser Ala Leu Glu Arg Ala Ala Val His Ala Lys Asn
225         230         235         240
Cys Gln Thr Thr Ala Gly Asn Gly Asn Pro Val Glu Cys Ala Gln Ser
245         250         255
Glu Ser Ser Phe Lys Met Ser Phe Lys Arg Glu Thr Lys Val Leu Lys
260         265         270
Thr Leu Ser Val Ile Met Gly Val Phe Val Cys Cys Trp Leu Pro Phe
275         280         285
Phe Ile Ser Asn Cys Met Val Pro Phe Cys Gly Ser Glu Glu Thr Gln
290         295         300
Pro Phe Cys Ile Asp Ser Ile Thr Phe Asp Val Phe Val Trp Phe Gly
305         310         315         320
Trp Ala Asn Ser Ser Leu Asn Pro Ile Ile Tyr Ala Phe Asn Ala Asp
325         330         335
Phe Gln Lys Ala Phe Ser Thr Leu Leu Gly Cys Tyr Arg Leu Cys Ala
340         345         350
Ala Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser
355         360         365
Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser
370         375         380

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<210> 6

<211> 451

<212> PRT

<213> Artificial Sequence

<220>

<223> amino acid sequence of 5HT1AR-V2R chimera
expressed from the pEArrB-1/5HT1AR vector

<400> 6

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Met Asp Val Leu Ser Pro Gly Gln Gly Asn Asn Thr Thr Ser Pro Pro
1          5          10          15
Ala Pro Phe Glu Thr Gly Gly Asn Thr Thr Gly Ile Ser Asp Val Thr
20         25         30
Val Ser Tyr Gln Val Ile Thr Ser Leu Leu Leu Gly Thr Leu Ile Phe

```

```

      35              40              45
Cys Ala Val Leu Gly Asn Ala Cys Val Val Ala Ala Ile Ala Leu Glu
  50              55              60
Arg Ser Leu Gln Asn Val Ala Asn Tyr Leu Ile Gly Ser Leu Ala Val
  65              70              75              80
Thr Asp Leu Met Val Ser Val Leu Val Leu Pro Met Ala Ala Leu Tyr
      85              90              95
Gln Val Leu Asn Lys Trp Thr Leu Gly Gln Val Thr Cys Asp Leu Phe
      100              105              110
Ile Ala Leu Asp Val Leu Cys Cys Thr Ser Ser Ile Leu His Leu Cys
      115              120              125
Ala Ile Ala Leu Asp Arg Tyr Trp Ala Ile Thr Asp Pro Ile Asp Tyr
      130              135              140
Val Asn Lys Arg Thr Pro Arg Arg Ala Ala Ala Leu Ile Ser Leu Thr
  145              150              155              160
Trp Leu Ile Gly Phe Leu Ile Ser Ile Pro Pro Met Leu Gly Trp Arg
      165              170              175
Thr Pro Glu Asp Arg Ser Asp Pro Asp Ala Cys Thr Ile Ser Lys Asp
      180              185              190
His Gly Tyr Thr Ile Tyr Ser Thr Phe Gly Ala Phe Tyr Ile Pro Leu
      195              200              205
Leu Leu Met Leu Val Leu Tyr Gly Arg Ile Phe Arg Ala Ala Arg Phe
      210              215              220
Arg Ile Arg Lys Thr Val Lys Lys Val Glu Lys Thr Gly Ala Asp Thr
  225              230              235              240
Arg His Gly Ala Ser Pro Ala Pro Gln Pro Lys Lys Ser Val Asn Gly
      245              250              255
Glu Ser Gly Ser Arg Asn Trp Arg Leu Gly Val Glu Ser Lys Ala Gly
      260              265              270
Gly Ala Leu Cys Ala Asn Gly Ala Val Arg Gln Gly Asp Asp Gly Ala
      275              280              285
Ala Leu Glu Val Ile Glu Val His Arg Val Gly Asn Ser Lys Glu His
      290              295              300
Leu Pro Leu Pro Ser Glu Ala Gly Pro Thr Pro Cys Ala Pro Ala Ser
  305              310              315              320
Phe Glu Arg Lys Asn Glu Arg Asn Ala Glu Ala Lys Arg Lys Met Ala
      325              330              335
Leu Ala Arg Glu Phe Lys Thr Val Lys Thr Leu Gly Ile Ile Met Gly
      340              345              350
Thr Phe Ile Leu Cys Trp Leu Pro Phe Phe Ile Val Ala Leu Val Leu
      355              360              365
Pro Phe Cys Glu Ser Ser Cys His Met Pro Thr Leu Leu Gly Ala Ile
      370              375              380
Ile Asn Trp Leu Gly Tyr Ser Asn Ser Leu Leu Asn Pro Val Ile Tyr
  385              390              395              400
Ala Tyr Phe Asn Lys Asp Phe Gln Asn Ala Phe Lys Lys Ile Ile Lys
      405              410              415
Cys Asn Phe Cys Ala Ala Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly
      420              425              430
Pro Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp
      435              440              445
Thr Ser Ser
      450

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<210> 7

<211> 394

<212> PRT

<213> Artificial Sequence

<220>

<223> amino acid sequence of beta3AR-V2R chimera
expressed from pEArrB-1/beta3AR vector

<400> 7

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Met Ala Pro Trp Pro His Glu Asn Ser Ser Leu Ala Pro Trp Pro Asp
 1          5          10          15
Leu Pro Thr Leu Ala Pro Asn Thr Ala Asn Thr Ser Gly Leu Pro Gly
 20          25          30
Val Pro Trp Glu Ala Ala Leu Ala Gly Ala Leu Leu Ala Leu Ala Val
 35          40          45
Leu Ala Thr Val Gly Gly Asn Leu Leu Val Ile Val Ala Ile Ala Trp
 50          55          60
Thr Pro Arg Leu Gln Thr Met Thr Asn Val Phe Val Thr Ser Leu Ala
 65          70          75          80
Ala Ala Asp Leu Val Met Gly Leu Leu Val Val Pro Pro Ala Ala Thr
 85          90          95
Leu Ala Leu Thr Gly His Trp Pro Leu Gly Ala Thr Gly Cys Glu Leu
100          105          110
Trp Thr Ser Val Asp Val Leu Cys Val Thr Ala Ser Ile Glu Thr Leu
115          120          125
Cys Ala Leu Ala Val Asp Arg Tyr Leu Ala Val Thr Asn Pro Leu Arg
130          135          140
Tyr Gly Ala Leu Val Thr Lys Arg Cys Ala Arg Thr Ala Val Val Leu
145          150          155          160
Val Trp Val Val Ser Ala Ala Val Ser Phe Ala Pro Ile Met Ser Gln
165          170          175
Trp Trp Arg Val Gly Ala Asp Ala Glu Ala Gln Arg Cys His Ser Asn
180          185          190
Pro Arg Cys Cys Ala Phe Ala Ser Asn Met Pro Tyr Val Leu Leu Ser
195          200          205
Ser Ser Val Ser Phe Tyr Leu Pro Leu Leu Val Met Leu Phe Val Tyr
210          215          220
Ala Arg Val Phe Val Val Ala Thr Arg Gln Leu Arg Leu Leu Arg Gly
225          230          235          240
Glu Leu Gly Arg Phe Pro Pro Glu Glu Ser Pro Pro Ala Pro Ser Arg
245          250          255
Ser Leu Ala Pro Ala Pro Val Gly Thr Cys Ala Pro Pro Glu Gly Val
260          265          270
Pro Ala Cys Gly Arg Arg Pro Ala Arg Leu Leu Pro Leu Arg Glu His
275          280          285
Arg Ala Leu Cys Thr Leu Gly Leu Ile Met Gly Thr Phe Thr Leu Cys
290          295          300
Trp Leu Pro Phe Phe Leu Ala Asn Val Leu Arg Ala Leu Gly Gly Pro
305          310          315          320
Ser Leu Val Pro Gly Pro Ala Phe Leu Ala Leu Asn Trp Leu Gly Tyr
325          330          335
Ala Asn Ser Ala Phe Asn Pro Leu Ile Tyr Cys Arg Ser Pro Asp Phe
340          345          350
Arg Ser Ala Phe Arg Arg Leu Leu Cys Arg Cys Ala Ala Ala Arg Gly
355          360          365
Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser Cys Thr Thr Ala
370          375          380
Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser

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385

390

<210> 8

<211> 362

<212> PRT

<213> Artificial Sequence

<220>

<223> amino acid sequence of Edg1R-V2R chimera expressed
from pEArrB-1/Edg1R vector

<400> 8

Met	Gly	Pro	Thr	Ser	Val	Pro	Leu	Val	Lys	Ala	His	Arg	Ser	Ser	Val
1				5					10					15	
Ser	Asp	Tyr	Val	Asn	Tyr	Asp	Ile	Ile	Val	Arg	His	Tyr	Asn	Tyr	Thr
			20					25					30		
Gly	Lys	Leu	Asn	Ile	Ser	Ala	Asp	Lys	Glu	Asn	Ser	Ile	Lys	Leu	Thr
		35					40					45			
Ser	Val	Val	Phe	Ile	Leu	Ile	Cys	Cys	Phe	Ile	Ile	Leu	Glu	Asn	Ile
		50				55					60				
Phe	Val	Leu	Leu	Thr	Ile	Trp	Lys	Thr	Lys	Lys	Phe	His	Arg	Pro	Met
65					70				75					80	
Tyr	Tyr	Phe	Ile	Gly	Asn	Leu	Ala	Leu	Ser	Asp	Leu	Leu	Ala	Gly	Val
			85					90					95		
Ala	Tyr	Thr	Ala	Asn	Leu	Leu	Leu	Ser	Gly	Ala	Thr	Thr	Tyr	Lys	Leu
			100					105					110		
Thr	Pro	Ala	Gln	Trp	Phe	Leu	Arg	Glu	Gly	Ser	Met	Phe	Val	Ala	Leu
		115					120					125			
Ser	Ala	Ser	Val	Phe	Ser	Leu	Leu	Ala	Ile	Ala	Ile	Glu	Arg	Tyr	Ile
		130				135					140				
Thr	Met	Leu	Lys	Met	Lys	Leu	His	Asn	Gly	Ser	Asn	Asn	Phe	Arg	Leu
145					150				155					160	
Phe	Leu	Leu	Ile	Ser	Ala	Cys	Trp	Val	Ile	Ser	Leu	Ile	Leu	Gly	Gly
			165					170					175		
Leu	Pro	Ile	Met	Gly	Trp	Asn	Cys	Ile	Ser	Ala	Leu	Ser	Ser	Cys	Ser
		180					185					190			
Thr	Val	Leu	Pro	Leu	Tyr	His	Lys	His	Tyr	Ile	Leu	Phe	Cys	Thr	Thr
		195					200					205			
Val	Phe	Thr	Leu	Leu	Leu	Leu	Ser	Ile	Val	Ile	Leu	Tyr	Cys	Arg	Ile
	210					215					220				
Tyr	Ser	Leu	Val	Arg	Thr	Arg	Ser	Arg	Arg	Leu	Thr	Phe	Arg	Lys	Asn
225				230					235					240	
Ile	Ser	Lys	Ala	Ser	Arg	Ser	Ser	Glu	Lys	Ser	Leu	Ala	Leu	Leu	Lys
			245					250					255		
Thr	Val	Ile	Ile	Val	Leu	Ser	Val	Phe	Ile	Ala	Cys	Trp	Ala	Pro	Leu
		260						265				270			
Phe	Ile	Leu	Leu	Leu	Asp	Val	Gly	Cys	Lys	Val	Lys	Thr	Cys	Asp	
		275				280					285				
Ile	Leu	Phe	Arg	Ala	Glu	Tyr	Phe	Leu	Val	Leu	Ala	Val	Leu	Asn	Ser
	290					295					300				
Gly	Thr	Asn	Pro	Ile	Ile	Tyr	Thr	Leu	Thr	Asn	Lys	Glu	Met	Arg	Arg
305				310					315					320	
Ala	Phe	Ile	Arg	Ile	Met	Ser	Cys	Cys	Lys	Cys	Ala	Ala	Ala	Arg	Gly
			325					330					335		
Arg	Thr	Pro	Pro	Ser	Leu	Gly	Pro	Gln	Asp	Glu	Ser	Cys	Thr	Thr	Ala
		340					345					350			

Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser
355 360

<210> 9

<211> 1113

<212> DNA

<213> Artificial Sequence

<220>

<223> nucleotide sequence of beta2AR-V2R chimera

<400> 9

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gaccacgacg tcacgcagca aagggacgag gtgtgggtgg tgggcatggg catcgatcatg 120
tctctcatcg tcctggccat cgtgtttggc aatgtgctgg tcatcacagc cattgccaag 180
ttcgagcgtc tgcagacggc caccaactac ttcactactt cactggcctg tgctgatctg 240
gtcatggggc tggcagtggg gccctttggg gccgcccata ttcttatgaa aatgtggact 300
tttggcaact tctggtgcca gttttggact tccattgatg tgctgtgcgt cacggccagc 360
attgagaccc tgtgcgtgat cgagtggtat cgctactttg ccattacttc acctttcaag 420
taccagagcc tgtgaccaa gaataaggcc cgggtgatca ttctgatggg gtggattgtg 480
tcaggcctta cctccttctt gccattcag atgcactggg accgggccac ccaccaggaa 540
gccatcaact gctatgccaa tgagacctgc tgtgacttct tcacgaacca agcctatgcc 600
attgectctt ccatcggtgc cttctacgtt cccctgggtga tcatggctct cgtctactcc 660
agggctcttc aggaggccaa aaggcagctc cagaagattg acaaactctga gggccgcttc 720
catgtccaga accttagcca ggtggagcag gatgggcgga cggggcatgg actccgcaga 780
tcttccaaat tctgcttgaa ggagcacaaa gccctcaaga cgtaggcat catcatgggc 840
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aacctcatcc gtaagggaat ttacatcctc ctaaattgga taggctatgt caattctggt 960
ttcaatcccc ttatctactg ccggagccca gatttcagga ttgccttcca ggagcttctc 1020
tgcccccggg gacgcacccc acccagcctg ggtccccaag atgagtcctg caccaccgac 1080
agctcctccc tggccaagga cacttcatcg tga 1113
```

<210> 10

<211> 1149

<212> DNA

<213> Artificial Sequence

<220>

<223> nucleotide sequence of MOR-V2R chimera

<400> 10

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atggacagca gcaccggccc agggaaacacc agcgactgct cagaccctt agctcaggca 60
agttgtcccc cagcacctgg ctctgggtc aacttgtccc acgttgatgg caaccagtcc 120
gatccatgcg gtctgaaccg caccgggctt ggccgggaac acagcctgtg cctcagacc 180
ggcagccctt ccatgggtcac agccattacc atcatggccc tctactctat cgtgtgtgta 240
gtgggcctct tcggaaactt cctgggtcatg tatgtgattg taagatacac caaaatgaag 300
actgccacca acatctacat ttccaacctt gctctggcag acgccttagc gaccagtaca 360
ctgccctttc agagtgtcaa ctacctgatg ggaacatggc ccttcggaac catcctctgc 420
aagatcgtag tctcaataga ttactacaac atgttcacca gcatattcac cctctgcacc 480
atgagcgtgg accgctacat tgctgtctgc caccagtc aagccctgga tttccgtacc 540
ccccgaaatg ccaaaatcgt caacgtctgc aactggatcc tctcttctgc catcggtctg 600
cctgtaatgt tcatggcaac cacaaaatac aggcaggggt ccatagattg caccctcacg 660
ttctcccacc caacctggta ctgggagaa ctgctcaaaa tctgtgtctt tatcttcgct 720
ttcatcatgc cgatcctcat catcactgtg tgttacggcc tgatgatctt acgactcaag 780
agcgttcgca tgctatcggg ctccaaagaa aaggacagga atctgcgcag gatcaccgag 840
atgggtgctgg tggctcgtggc tgtatttatc gtctgctgga ccccatcca catctacgtc 900
```

```

atcatcaaag cgctgatcac gattccagaa accacatttc agaccgtttc ctggcacttc 960
tgcattgctt tgggttacac gaacagctgc ctgaatccag ttctttacgc cttcctggat 1020
gaaaacttca agcgatgctt cagagagttc tgcgcggccg cacggggacg caccaccacc 1080
agcctgggtc cccaagatga gtcctgcacc accgccagct cctccctggc caaggacact 1140
tcacgtga                                     1149

```

<210> 11

<211> 1148

<212> DNA

<213> Artificial Sequence

<220>

<223> nucleotide sequence of D1AR-V2R chimera

<400> 11

```

atggctccta acacttctac catggatgag gccgggctgc cagcggagag ggatttctcc 60
tttcgcatcc tcacggcctg tttcctgtca ctgctcatcc tgtccactct cctgggcaat 120
acccttgctt gtgcggccgt catccggttt cgacacctga ggtccaaggt gaccaacttc 180
tttgtcatct ctttagctgt gtcagatctc ttggtggctg tcctgggtcat gccctggaaa 240
gctgtggccg agattgctgg cttttggccc tttgggtcct tttgtaacat ctgggtagcc 300
tttgacatca tgtgctctac ggcgtccatt ctgaacctct gcgtgatcag cgtggacagg 360
tactgggcta tctccagccc tttccagtat gagaggaaga tgacccccaag agcagccttc 420
atcctgatta gcgtagcatg gactctgtct gtccttatat ccttcatccc agtacagcta 480
agctggcaca aggcaaagcc cacatggccc ttggatggca attttacctc cctggaggac 540
accgaggatg acaactgtga cacaagggtg agcaggacgt atgccatttc atcgctccctc 600
atcagctttt acatccccgt agccattatg atcgctacct acaccagtat ctacaggatt 660
gcccagaagc aaaccggcgc atctcagcct tggagagggc agcagtccat gccagaatt 720
gccagaccac cgcaggtaac gggaaccccg tcgaatgcgc ccagtctgaa agttccttta 780
agatgtcctt caagagggag acgaaaagtc taaagacgct gtctgtgatc atgggggtgt 840
ttgtgtgctg ctggctccct ttcttcattc cgaactgtat ggtgcccttc tgtggctctg 900
aggagaccac gccattctgc atcgattcca tcaccttcga tgtgtttgtg tggtttgggt 960
gggcgaattc ttcctgaac cccattatct atgcttttaa tgctgacttc cagaaggcgt 1020
tctcaacctt cttaggatgc tacagactct gcgcggccgc acggggacgc accccacca 1080
gcctgggtcc ccaagatgag tcctgcacca ccgccagctc ctccctggcc aaggacactt 1140
catcgtga                                     1148

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<210> 12

<211> 1356

<212> DNA

<213> Artificial Sequence

<220>

<223> nucleotide sequence of 5HT1AR-V2R chimera

<400> 12

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atggatgtgc tcagccctgg tcagggaac aacaccacat caccaccggc tccctttgag 60
accggcggca acactactgg tatctccgac gtgaccgtca gctaccaagt gatcacctct 120
ctgctgctgg gcacgctcat cttctgcgcg gtgctgggca atgctgctgt ggtggctgcc 180
atcgctttgg agcgctccct gcagaacgtg gccaatatc ttattggctc tttggcggtc 240
accgacctca tgggtgctgg gttggtgctg cccatggccg cgctgtatca ggtgctcaac 300
aagtggacac tgggccaggt aacctgcgac ctgttcatcg ccctcgacgt gctgtgctgc 360
acctcatcca tcttgacact gtgcgccatc gcgctggaca ggtactgggc catcacggac 420
cccatcgact acgtgaacaa gaggacgccc cggcgcgccg ctgcgctcat ctgcctcact 480
tggtttattg gcttctcat ctctatcccc cccatgctgg gctggcgcac cccggaagac 540
cgctcggacc ccgacgatg caccattagc aaggatcatg gctacactat ctattccacc 600
tttggagctt tctacatccc gctgctgctc atgctgggtc tctatgggcg catattccga 660
gctgcgcgct tccgcatccg caagacggtc aaaaagggtg agaagaccgg agcggacacc 720

```

```

cgccatggag catctccgcg cccgcagccc aagaagagtg tgaatggaga gtcgggggagc 780
aggaactgga ggctggggcgt ggagagcaag gctgggggtg ctctgtgcgc caatggcgcg 840
gtgaggcaag gtgacgatgg cgccgccctg gaggtgatcg aggtgcaccg agtgggcaac 900
tccaaagagc acttgccctc gccagcgag gctggtccta ccccttgtgc ccccgccctc 960
ttcgagagga aaaatgagcg caacgccgag gcgaagcgca agatggccct ggcccagagag 1020
aggaagacag tgaagacgct gggcatcatc atgggcacct tcacccctcg ctggctgccc 1080
ttcttcatcg tggctcttgt tctgcccttc tgcgagagca gctgccacat gccaccctg 1140
ttgggcgcca taatcaattg gctgggtac tccaaactctc tgcttaacct cgtcatttac 1200
gcatacttca acaaggactt tcaaaacgcy tttaagaaga tcattaagtg taacttctgc 1260
gcggccgcac ggggacgcac cccaccagc ctgggtcccc aagatgagtc ctgcaccacc 1320
gccagtcctt ccctggccaa ggacacttca tcgtga 1356

```

<210> 13

<211> 1185

<212> DNA

<213> Artificial Sequence

<220>

<223> nucleotide sequence of beta3-AR-V2R chimera

<400> 13

```

atggctccgt ggccctcacga gaacagctct cttgccccat ggccggacct cccaccctg 60
gcgccaata ccgccaacac cagtgggctg ccaggggttc cgtgggaggc ggccctagcc 120
ggggccctgc tggcgctggc ggtgctggcc accgtgggag gcaacctgct ggtcatcgctg 180
gccatcgctt ggactccgag actccagacc atgaccaacg tgttcgtgac ttcgctggcc 240
gcagccgacc tggatgatgg actcctgggt gtgccgccgg cggccacctt ggcgctgact 300
ggccactggc cgttgggcgc cactggctgc gagctgtgga cctcggtgga cgtgctgtgt 360
gtgaccgcca gcatcgaaac cctgtgcgcc ctggccgtgg accgctacct ggctgtgacc 420
aacccgctgc gttacggcgc actggtcacc aagcgctgcg cccggacagc tgtggtcctg 480
gtgtgggtcg tgtcggcgcc ggtgtcgttt gcgcccatca tgagccagtg gtggcgcgta 540
ggggcgagcg ccgagggcga gcgctgccac tccaaccgcy gctgctgtgc cttcgccctc 600
aacatgccct acgtgctgct gtccctctcc gtctccttct accttccctt tctcgtgatg 660
ctcttcgtct acgcgcgggt tttcgtgggt gctacgcgcc agctgcgctt gctgcgcggg 720
gagctgggcc gctttccgcc cgaggagtct ccgcccgcgc cgtcgcgctc tctggccccg 780
gccccggtgg ggacgtgcgc tccgccgaa ggggtgcccc cctgcggccg gcggccccgcg 840
cgctcctgc ctctccggga acaccgggc ctgtgcacct tgggtctcat catgggcacc 900
ttcactctct gctggttgcc cttctttctg gccaacgtgc tgcgcgccct ggggggcccc 960
tctctagtcc cgggcccggc tttccttgcc ctgaactggc taggttatgc caattctgcc 1020
ttcaaccgcy tcactactg ccgcagccc gactttcgca gcgccttccg ccgtcttctg 1080
tgccgctgcy cggccgcacg gggacgcacc ccaccagcc tgggtcccca agatgagtc 1140
tgcaccaccg ccagtcctc cctggccaag gacacttcat cgtga 1185

```

<210> 14

<211> 1089

<212> DNA

<213> Artificial Sequence

<220>

<223> nucleotide sequence of Edg1-V2R chimera

<400> 14

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atggggccca ccagcgtccc gctgggtcaag gccaccgca gctcgggtctc tgactacgtc 60
aactatgata tcactgtccg gcattacaac tacacgggaa agctgaatat cagcgcggac 120
aaggagaaca gcattaaact gacctcgggt gtgttcattc tcactgtctg ctttatcatc 180
ctggagaaca tctttgtctt gctgaccatt tggaaaacca agaaattcca ccgacccatg 240
tactatttta ttggcaatct ggccctctca gacctgttgg caggagtagc ctacacagct 300
aacctgctct tgtctggggc caccacctac aagctcactc ccgcccagtg gtttctgcgg 360

```

```

gaagggagta tgtttgtggc cctgtcagcc tccgtgttca gtctcctcgc catcgccatt 420
gagcgctata tcacaatgct gaaaatgaaa ctccacaacg ggagcaataa cttccgcctc 480
ttcctgctaa tcagcgccctg ctgggtcatc tccctcatcc tgggtggcct gcctatcatg 540
ggctggaact gcacagtgct gctgtccagc tgctccaccg tgctgccgct ctaccacaag 600
cactatatcc tcttctgcac cacgggtcttc actctgcttc tgctctccat cgtcattctg 660
tactgcagaa tctactcctt ggtcaggact cggagccgcc gcctgacggt ccgcaagaac 720
atttccaagg ccagccgcag ctctgagaag tcgctggcgc tgctcaagac cgtaattatc 780
gtcctgagcg tcttcatcgc ctgctgggca ccgctcttca tcctgctcct gctggatgtg 840
ggctgcaagg tgaagacctg tgacatcctc ttcagagcgg agtacttcct ggtgttagct 900
gtgctcaact ccggcaccaa ccccatcatt tacactctga ccaacaagga gatgcgtcgg 960
gccttcatcc ggatcatgtc ctgctgcaag tgcgcggccg cacggggacg caccaccac 1020
agcctgggtc cccaagatga gtctgcacc accgccagct cctccctggc caaggacact 1080
tcatcgtga                                     1089

```

<210> 15

<211> 43

<212> PRT

<213> Homo sapiens

<400> 15

```

Asn Pro Ile Val Tyr Ala Phe Arg Ile Gln Lys Phe Arg Val Thr Phe
 1             5             10             15
Leu Lys Ile Trp Asn Asp His Phe Arg Cys Gln Pro Ala Pro Pro Ile
 20             25             30
Asp Glu Asp Leu Pro Glu Glu Arg Pro Asp Asp
 35             40

```

<210> 16

<211> 176

<212> PRT

<213> Homo sapiens

<400> 16

```

Asn Pro Ile Ile Tyr Pro Cys Ser Ser Lys Glu Phe Arg Ala Phe Val
 1             5             10             15
Arg Ile Leu Gly Cys Gln Cys Arg Gly Arg Gly Arg Arg Arg Arg
 20             25             30
Arg Arg Arg Arg Leu Gly Gly Cys Ala Tyr Thr Tyr Arg Pro Trp Thr
 35             40             45
Arg Gly Gly Ser Leu Glu Arg Ser Gln Ser Arg Lys Asp Ser Leu Asp
 50             55             60
Asp Ser Gly Ser Cys Leu Ser Gly Ser Gln Arg Thr Leu Pro Ser Ala
 65             70             75             80
Ser Pro Ser Pro Gly Tyr Leu Gly Arg Gly Ala Pro Pro Pro Val Glu
 85             90             95
Leu Cys Ala Phe Pro Glu Trp Lys Ala Pro Gly Ala Leu Leu Ser Leu
 100            105            110
Pro Ala Pro Glu Pro Pro Gly Arg Gly Arg His Asp Ser Gly Pro
 115            120            125
Leu Phe Thr Phe Lys Leu Leu Thr Glu Pro Glu Ser Pro Gly Thr Asp
 130            135            140
Gly Gly Ala Ser Asn Gly Gly Cys Glu Ala Ala Ala Asp Val Ala Asn
 145            150            155            160
Gly Gln Pro Gly Phe Lys Ser Asn Met Pro Leu Ala Pro Gly Gln Phe
 165            170            175

```

<210> 17
 <211> 29
 <212> PRT
 <213> Homo sapiens

<400> 17
 Asn Pro Val Ile Tyr Thr Ile Phe Asn His Asp Phe Arg Arg Ala Phe
 1 5 10 15
 Lys Lys Ile Leu Cys Arg Gly Asp Arg Lys Arg Ile Val
 20 25

<210> 18
 <211> 29
 <212> PRT
 <213> Human

<400> 18
 Asn Pro Val Ile Tyr Thr Ile Phe Asn Gln Asp Phe Arg Arg Ala Phe
 1 5 10 15
 Arg Arg Ile Leu Cys Arg Pro Trp Thr Gln Thr Ala Trp
 20 25

<210> 19
 <211> 31
 <212> PRT
 <213> Human

<400> 19
 Asn Pro Val Ile Tyr Thr Val Phe Asn Gln Asp Phe Arg Pro Ser Phe
 1 5 10 15
 Lys His Ile Leu Phe Arg Arg Arg Arg Arg Arg Gly Phe Arg Gln
 20 25 30

<210> 20
 <211> 105
 <212> PRT
 <213> Homo sapiens

<400> 20
 Asn Pro Ile Ile Tyr Cys Arg Ser Pro Asp Phe Arg Lys Ala Phe Gln
 1 5 10 15
 Gly Leu Leu Cys Cys Ala Arg Arg Ala Ala Arg Arg Arg His Ala Thr
 20 25 30
 His Gly Asp Arg Pro Arg Ala Ser Gly Cys Leu Ala Arg Pro Gly Pro
 35 40 45
 Pro Pro Ser Pro Gly Ala Ala Ser Asp Asp Asp Asp Asp Val Val
 50 55 60
 Gly Ala Thr Pro Pro Ala Arg Leu Leu Glu Pro Trp Ala Gly Cys Asn
 65 70 75 80
 Gly Gly Ala Ala Ala Asp Ser Asp Ser Ser Leu Asp Glu Pro Cys Arg
 85 90 95
 Pro Gly Phe Ala Ser Glu Ser Lys Val
 100 105

<210> 21
 <211> 92
 <212> PRT
 <213> Homo sapiens

<400> 21
 Asn Pro Leu Ile Tyr Cys Arg Ser Pro Asp Phe Arg Ile Ala Phe Gln
 1 5 10 15
 Glu Leu Leu Cys Leu Arg Arg Ser Ser Leu Lys Ala Tyr Gly Asn Gly
 20 25 30
 Tyr Ser Ser Asn Gly Asn Thr Gly Glu Gln Ser Gly Tyr His Val Glu
 35 40 45
 Gln Glu Lys Glu Asn Lys Leu Leu Cys Glu Asp Leu Pro Gly Thr Glu
 50 55 60
 Asp Phe Val Gly His Gln Gly Thr Val Pro Ser Asp Asn Ile Asp Ser
 65 70 75 80
 Gln Gly Arg Asn Cys Ser Thr Asn Asp Ser Leu Leu
 85 90

<210> 22
 <211> 120
 <212> PRT
 <213> Homo sapiens

<400> 22
 Asn Pro Ile Ile Tyr Ala Phe Asn Ala Asp Phe Arg Lys Ala Phe Ser
 1 5 10 15
 Thr Leu Leu Gly Cys Tyr Arg Leu Cys Pro Ala Thr Asn Asn Ala Ile
 20 25 30
 Glu Thr Val Ser Ile Asn Asn Asn Gly Ala Ala Met Phe Ser Ser His
 35 40 45
 His Glu Pro Arg Gly Ser Ile Ser Lys Glu Cys Asn Leu Val Tyr Leu
 50 55 60
 Ile Pro His Ala Val Gly Ser Ser Glu Asp Leu Lys Lys Glu Glu Ala
 65 70 75 80
 Ala Gly Ile Ala Arg Pro Leu Glu Lys Leu Ser Pro Ala Leu Ser Val
 85 90 95
 Ile Leu Asp Tyr Asp Thr Asp Val Ser Leu Glu Lys Ile Gln Pro Ile
 100 105 110
 Thr Gln Asn Gly Gln His Pro Thr
 115 120

<210> 23
 <211> 22
 <212> PRT
 <213> Human

<400> 23
 Asn Pro Ile Ile Tyr Thr Thr Phe Asn Ile Glu Phe Arg Lys Ala Phe
 1 5 10 15
 Leu Lys Ile Leu His Cys
 20

<210> 24
 <211> 22
 <212> PRT
 <213> Human

<400> 24
 Asn Pro Val Ile Tyr Thr Thr Phe Asn Ile Glu Phe Arg Lys Ala Phe
 1 5 10 15
 Leu Lys Ile Leu Ser Cys
 20

<210> 25
 <211> 24
 <212> PRT
 <213> Human

<400> 25
 Asn Pro Val Ile Tyr Thr Val Phe Asn Ala Glu Phe Arg Asn Val Phe
 1 5 10 15
 Arg Lys Ala Leu Arg Ala Cys Cys
 20

<210> 26
 <211> 123
 <212> PRT
 <213> Human

<400> 26
 Asn Pro Val Ile Tyr Ala Phe Asn Ala Asp Phe Gln Lys Val Phe Ala
 1 5 10 15
 Gln Leu Leu Gly Cys Ser His Phe Cys Ser Arg Thr Pro Val Glu Thr
 20 25 30
 Val Asn Ile Ser Asn Glu Leu Ile Ser Tyr Asn Gln Asp Ile Val Phe
 35 40 45
 His Lys Glu Ile Ala Ala Ala Tyr Ile His Met Met Pro Asn Ala Val
 50 55 60
 Thr Pro Gly Asn Arg Glu Val Asp Asn Asp Glu Glu Glu Gly Pro Phe
 65 70 75 80
 Asp Arg Met Phe Gln Ile Tyr Gln Thr Ser Pro Asp Gly Asp Pro Val
 85 90 95
 Ala Glu Ser Val Trp Glu Leu Asp Cys Glu Gly Glu Ile Ser Leu Asp
 100 105 110
 Lys Ile Thr Pro Phe Thr Pro Asn Gly Phe His
 115 120

<210> 27
 <211> 47
 <212> PRT
 <213> Homo sapiens

<400> 27
 Asn Pro Met Cys Tyr Ala Leu Cys Asn Lys Ala Phe Arg Asp Thr Phe
 1 5 10 15


```

Arg Leu Leu Leu Leu Cys Arg Trp Asp Lys Arg Arg Trp Arg Lys Ile
      20              25              30
Pro Lys Arg Pro Gly Ser Val His Arg Thr Pro Ser Arg Gln Cys
      35              40              45

```

```

<210> 28
<211> 31
<212> PRT
<213> Homo sapiens

```

```

<400> 28
Asn Pro Ala Cys Tyr Ala Leu Cys Asn Ala Thr Phe Lys Lys Thr Phe
  1              5              10              15
Lys His Leu Leu Met Cys His Tyr Lys Asn Ile Gly Ala Thr Arg
      20              25              30

```

```

<210> 29
<211> 51
<212> PRT
<213> Homo sapiens

```

```

<400> 29
Asn Pro Val Cys Tyr Ala Leu Cys Asn Lys Thr Phe Arg Thr Thr Phe
  1              5              10              15
Lys Met Leu Leu Leu Cys Gln Cys Asp Lys Lys Lys Arg Arg Lys Gln
      20              25              30
Gln Tyr Gln Gln Arg Gln Ser Val Ile Phe His Lys Arg Ala Pro Glu
      35              40              45
Gln Ala Leu
      50

```

```

<210> 30
<211> 31
<212> PRT
<213> Homo sapiens

```

```

<400> 30
Asn Pro Ala Cys Tyr Ala Leu Cys Asn Ala Thr Phe Lys Lys Thr Phe
  1              5              10              15
Arg His Leu Leu Leu Cys Gln Tyr Arg Asn Ile Gly Thr Ala Arg
      20              25              30

```

```

<210> 31
<211> 42
<212> PRT
<213> Artificial Sequence

```

```

<220>
<223> m5 muscarinic receptor

```

```

<400> 31
Asn Pro Ile Cys Tyr Ala Leu Cys Asn Arg Thr Phe Arg Lys Thr Phe
  1              5              10              15

```

```

Lys Met Leu Leu Leu Cys Arg Trp Lys Lys Lys Lys Val Glu Glu Lys
      20                      25                      30
Leu Tyr Trp Gln Gly Asn Ser Lys Leu Pro
      35                      40

```

```

<210> 32
<211> 24
<212> PRT
<213> Homo sapiens

```

```

<400> 32
Asn Pro Val Ile Tyr Ala Tyr Phe Asn Lys Asp Phe Gln Asn Ala Phe
  1           5           10           15
Lys Lys Ile Ile Lys Cys Lys Phe
      20

```

```

<210> 33
<211> 26
<212> PRT
<213> Homo sapiens

```

```

<400> 33
Asn Pro Ile Ile Tyr Thr Met Ser Asn Glu Asp Phe Lys Gln Ala Phe
  1           5           10           15
His Lys Leu Ile Arg Phe Lys Cys Thr Ser
      20           25

```

```

<210> 34
<211> 24
<212> PRT
<213> Homo sapiens

```

```

<400> 34
Asn Pro Leu Leu Tyr Thr Ser Phe Asn Glu Asp Phe Lys Leu Ala Phe
  1           5           10           15
Lys Lys Leu Ile Arg Cys Arg Glu
      20

```

```

<210> 35
<211> 37
<212> PRT
<213> Artificial Sequence

```

```

<220>
<223> olfactory receptor 6A1

```

```

<400> 35
Asn Pro Ile Ile Tyr Cys Leu Arg Asn Gln Glu Val Lys Arg Ala Leu
  1           5           10           15
Cys Cys Ile Leu His Leu Tyr Gln His Gln Asp Pro Asp Pro Lys Lys
      20           25           30
Gly Ser Arg Asn Val
      35

```

<210> 36
 <211> 27
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> olfactory receptor 2C1

<400> 36
 Asn Pro Leu Ile Tyr Thr Leu Arg Asn Met Glu Val Lys Gly Ala Leu
 1 5 10 15
 Arg Arg Leu Leu Gly Lys Gly Arg Glu Val Gly
 20 25

<210> 37
 <211> 62
 <212> PRT
 <213> Homo sapiens

<400> 37
 Asn Pro Leu Phe Tyr Gly Phe Leu Gly Lys Lys Phe Lys Arg Tyr Phe
 1 5 10 15
 Leu Gln Leu Leu Lys Tyr Ile Pro Pro Lys Ala Lys Ser His Ser Asn
 20 25 30
 Leu Ser Thr Lys Met Ser Thr Leu Ser Tyr Arg Pro Ser Asp Asn Val
 35 40 45
 Ser Ser Ser Thr Lys Lys Pro Ala Pro Cys Phe Glu Val Glu
 50 55 60

<210> 38
 <211> 50
 <212> PRT
 <213> Homo sapiens

<400> 38
 Asn Pro Phe Leu Tyr Cys Phe Val Gly Asn Arg Phe Gln Gln Lys Leu
 1 5 10 15
 Arg Ser Val Phe Arg Val Pro Ile Thr Trp Leu Gln Gly Lys Arg Glu
 20 25 30
 Ser Met Ser Cys Arg Lys Ser Ser Leu Arg Glu Met Glu Thr Phe
 35 40 45
 Val Ser
 50

<210> 39
 <211> 51
 <212> PRT
 <213> Homo sapiens

<400> 39
 Asn Pro Leu Ile Tyr Ala Phe Ile Gly Gln Lys Phe Arg His Gly Leu
 1 5 10 15

```

Leu Lys Ile Leu Ala Ile His Gly Leu Ile Ser Lys Asp Ser Leu Pro
      20              25              30
Lys Asp Ser Arg Pro Ser Phe Val Gly Ser Ser Ser Gly His Thr Ser
      35              40              45
Thr Thr Leu
      50

```

<210> 40

<211> 67

<212> PRT

<213> Artificial Sequence

<220>

<223> cx3c chemokine receptor 1 (cx3crl) (fractalkine
receptor)

<400> 40

```

Asn Pro Leu Ile Tyr Ala Phe Ala Gly Glu Lys Phe Arg Arg Tyr Leu
  1              5              10              15
Tyr His Leu Tyr Gly Lys Cys Leu Ala Val Leu Cys Gly Arg Ser Val
      20              25              30
His Val Asp Phe Ser Ser Ser Glu Ser Gln Arg Ser Arg His Gly Ser
      35              40              45
Val Leu Ser Ser Asn Phe Thr Tyr His Thr Ser Asp Gly Asp Ala Leu
      50              55              60
Leu Leu Leu
      65

```

<210> 41

<211> 59

<212> PRT

<213> Human

<400> 41

```

Asn Pro Ile Leu Tyr Asn Leu Val Ser Ala Asn Phe Arg His Ile Phe
  1              5              10              15
Leu Ala Thr Leu Ala Cys Leu Cys Pro Val Trp Arg Arg Arg Arg Lys
      20              25              30
Arg Pro Ala Phe Ser Arg Lys Ala Asp Ser Val Ser Ser Asn His Thr
      35              40              45
Leu Ser Ser Asn Ala Thr Arg Glu Thr Leu Tyr
      50              55

```

<210> 42

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> substance-P receptor (SPR) (NK-1 receptor) (NK-1R)

<400> 42

```

Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe
  1              5              10              15

```

```

Lys His Ala Phe Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu
      20      25      30
Gly Leu Glu Met Lys Ser Thr Arg Tyr Leu Gln Thr Gln Gly Ser Val
      35      40      45
Tyr Lys Val Ser Arg Leu Glu Thr Thr Ile Ser Thr Val Val Gly Ala
      50      55      60
His Glu Glu Glu Pro Glu Asp Gly Pro Lys Ala Thr Pro Ser Ser Leu
      65      70      75      80
Asp Leu Thr Ser Asn Cys Ser Ser Arg Ser Asp Ser Lys Thr Met Thr
      85      90      95
Glu Ser Phe Ser Phe Ser Ser Asn Val Leu Ser
      100      105

```

<210> 43
 <211> 50
 <212> PRT
 <213> Homo sapiens

```

<400> 43
Asn Pro Trp Ile Tyr Ala Ser Phe Ser Ser Val Ser Ser Glu Leu Arg
  1      5      10      15
Ser Leu Leu Cys Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro
      20      25      30
Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Thr
      35      40      45
Ser Ser
      50

```

<210> 44
 <211> 83
 <212> PRT
 <213> Human

```

<400> 44
Asn Pro Val Ile Tyr Asn Leu Met Ser Gln Lys Phe Arg Ala Ala Phe
  1      5      10      15
Arg Lys Leu Cys Asn Cys Lys Gln Lys Pro Thr Glu Lys Pro Ala Asn
      20      25      30
Tyr Ser Val Ala Leu Asn Tyr Ser Val Ile Lys Glu Ser Asp His Phe
      35      40      45
Ser Thr Glu Leu Asp Asp Ile Thr Val Thr Asp Thr Tyr Leu Ser Ala
      50      55      60
Thr Lys Val Ser Phe Asp Asp Thr Cys Leu Ala Ser Glu Val Ser Phe
      65      70      75      80
Ser Gln Ser

```

<210> 45
 <211> 65
 <212> PRT
 <213> Human

```

<400> 45
Asn Pro Trp Ile Tyr Met Leu Phe Thr Gly His Leu Phe His Glu Leu

```

```

      1           5           10           15
Val Gln Arg Phe Leu Cys Cys Ser Ala Ser Tyr Leu Lys Gly Arg Arg
      20           25           30
Leu Gly Glu Thr Ser Ala Ser Lys Lys Ser Asn Ser Ser Ser Phe Val
      35           40           45
Leu Ser His Arg Ser Ser Ser Gln Arg Ser Cys Ser Gln Pro Ser Thr
      50           55           60
Ala
65

```

<210> 46
 <211> 75
 <212> PRT
 <213> Homo sapiens

```

<400> 46
Asn Pro Val Leu Tyr Ser Leu Met Ser Ser Arg Phe Arg Glu Thr Phe
  1           5           10           15
Gln Glu Ala Leu Cys Leu Gly Ala Cys Cys His Arg Leu Arg Pro Arg
      20           25           30
His Ser Ser His Ser Leu Ser Arg Met Thr Thr Gly Ser Thr Leu Cys
      35           40           45
Asp Val Gly Ser Leu Gly Ser Trp Val His Pro Leu Ala Gly Asn Asp
      50           55           60
Gly Pro Glu Ala Gln Gln Glu Thr Asp Pro Ser
65           70           75

```

<210> 47
 <211> 62
 <212> PRT
 <213> Homo sapiens

```

<400> 47
Asn Pro Leu Val Tyr Cys Phe Met His Arg Arg Phe Arg Gln Ala Cys
  1           5           10           15
Leu Glu Thr Cys Ala Arg Cys Cys Pro Arg Pro Pro Arg Ala Arg Pro
      20           25           30
Arg Ala Leu Pro Asp Glu Asp Pro Pro Thr Pro Ser Ile Ala Ser Leu
      35           40           45
Ser Arg Leu Ser Tyr Thr Thr Ile Ser Thr Leu Gly Pro Gly
      50           55           60

```

<210> 48
 <211> 82
 <212> PRT
 <213> Homo sapiens

```

<400> 48
Asn Pro Leu Val Tyr Ala Leu Ala Ser Arg His Phe Arg Ala Arg Phe
  1           5           10           15
Arg Arg Leu Trp Pro Cys Gly Arg Arg Arg Arg His Arg Ala Arg Arg
      20           25           30
Ala Leu Arg Arg Val Arg Pro Ala Ser Ser Gly Pro Pro Gly Cys Pro
      35           40           45

```

```

Gly Asp Ala Arg Pro Ser Gly Arg Leu Leu Ala Gly Gly Gly Gln Gly
 50          55          60
Pro Glu Pro Arg Glu Gly Pro Val His Gly Gly Glu Ala Ala Arg Gly
65          70          75          80
Pro Glu

```

<210> 49
 <211> 76
 <212> PRT
 <213> Human

```

<400> 49
Asn Pro Ile Ile Tyr Thr Leu Thr Asn Lys Glu Met Arg Arg Ala Phe
 1          5          10          15
Ile Arg Ile Met Ser Cys Cys Lys Cys Pro Ser Gly Asp Ser Ala Gly
          20          25          30
Lys Phe Lys Arg Pro Ile Ile Ala Gly Met Glu Phe Ser Arg Ser Lys
          35          40          45
Ser Asp Asn Ser Ser His Pro Gln Lys Asp Glu Gly Asp Asn Pro Glu
 50          55          60
Thr Ile Met Ser Ser Gly Asn Val Asn Ser Ser Ser
65          70          75

```

<210> 50
 <211> 80
 <212> PRT
 <213> Homo sapiens

```

<400> 50
Asn Pro Ile Ile Tyr Ala Leu Arg Ser Lys Asp Leu Arg His Ala Phe
 1          5          10          15
Arg Ser Met Phe Pro Ser Cys Glu Gly Thr Ala Gln Pro Leu Asp Asn
          20          25          30
Ser Met Gly Asp Ser Asp Cys Leu His Lys His Ala Asn Asn Ala Ala
          35          40          45
Ser Val His Arg Ala Ala Glu Ser Cys Ile Lys Ser Thr Val Lys Ile
 50          55          60
Ala Lys Val Thr Met Ser Val Ser Thr Asp Thr Ser Ala Glu Ala Leu
65          70          75          80

```

<210> 51
 <211> 59
 <212> PRT
 <213> Human

```

<400> 51
Asn Pro Val Leu Tyr Ala Phe Leu Asp Glu Asn Phe Lys Arg Cys Phe
 1          5          10          15
Arg Gln Leu Cys Arg Lys Pro Cys Gly Arg Pro Asp Pro Ser Ser Phe
          20          25          30
Ser Arg Pro Arg Glu Ala Thr Ala Arg Glu Arg Val Thr Ala Cys Thr
          35          40          45
Pro Ser Asp Gly Pro Gly Gly Gly Arg Ala Ala

```

50

55

<210> 52
 <211> 58
 <212> PRT
 <213> Human

<400> 52
 Asp Pro Phe Val Tyr Tyr Phe Val Ser His Asp Phe Arg Asp His Ala
 1 5 10 15
 Lys Asn Ala Leu Leu Cys Arg Ser Val Arg Thr Val Lys Gln Met Gln
 20 25 30
 Val Ser Leu Thr Ser Lys Lys His Ser Arg Lys Ser Ser Ser Tyr Ser
 35 40 45
 Ser Ser Ser Thr Thr Val Lys Thr Ser Tyr
 50 55

<210> 53
 <211> 66
 <212> PRT
 <213> Rat

<400> 53
 Asn Gly Glu Val Gln Ala Glu Leu Arg Arg Lys Trp Arg Arg Trp His
 1 5 10 15
 Leu Gln Gly Val Leu Gly Trp Ser Ser Lys Ser Gln His Pro Trp Gly
 20 25 30
 Gly Ser Asn Gly Ala Thr Cys Ser Thr Gln Val Ser Met Leu Thr Arg
 35 40 45
 Val Ser Pro Ser Ala Arg Arg Ser Ser Ser Phe Gln Ala Glu Val Ser
 50 55 60
 Leu Val
 65

<210> 54
 <211> 90
 <212> DNA
 <213> Human

<400> 54
 gcccggggac gcacccacc cagcctgggt cccaagatg agtcctgcac caccgccagc 60
 tctccctgg ccaaggacac ttcacgtga 90

<210> 55
 <211> 114
 <212> DNA
 <213> Human

<400> 55
 gcggccgcac ggggacgcac cccaccagc ctgggtcccc aagatgagtc ctgcaccacc 60
 gccagtcct ccctggccaa ggacattca tcgtgaagat ctccgcggtc taga 114

<210> 56
 <211> 31

<212> PRT
 <213> Artificial Sequence

<220>
 <223> carboxy terminus of modified GPCR

<400> 56
 Ala Ala Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu
 1 5 10 15
 Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser
 20 25 30

<210> 57
 <211> 30
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> carboxyl-terminal tail of V2R

<400> 57
 Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser
 1 5 10 15
 Cys Thr Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser
 20 25 30

<210> 58
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> V2R mutant receptor

<400> 58
 Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser
 1 5 10 15
 Cys Thr Thr Thr Ala
 20

<210> 59
 <211> 30
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> V2R mutant receptor

<400> 59
 Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser
 1 5 10 15
 Cys Thr Thr Ala Ala Ala Ala Leu Ala Lys Asp Ala Ala Ala
 20 25 30

<210> 60
 <211> 30
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> V2R mutant receptor

<400> 60
 Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser
 1 5 10 15
 Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Ala Ala Ala
 20 25 30

<210> 61
 <211> 30
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> V2R mutant receptor

<400> 61
 Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser
 1 5 10 15
 Cys Thr Thr Ala Ala Ala Leu Ala Lys Asp Thr Ser Ser
 20 25 30

<210> 62
 <211> 30
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> beta-2AR mutant receptor

<400> 62
 Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser
 1 5 10 15
 Cys Thr Thr Ala Ala Ala Leu Ala Lys Asp Thr Ser Ser
 20 25 30

<210> 63
 <211> 73
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> carboxyl-terminal tail of beta-2AR

<400> 63
 Cys Leu Arg Arg Ser Ser Leu Lys Ala Tyr Gly Asn Gly Tyr Ser Ser
 1 5 10 15

```

Asn Gly Asn Thr Gly Glu Gln Ser Gly Tyr His Val Glu Gln Glu Lys
      20      25      30
Glu Asn Lys Leu Leu Cys Glu Asp Leu Pro Gly Thr Glu Asp Phe Val
      35      40      45
Gly His Gln Gly Thr Val Pro Ser Asp Asn Ile Asp Ser Gln Gly Arg
      50      55      60
Asn Cys Ser Thr Asn Asp Ser Leu Leu
      65      70

```

<210> 64

<211> 83

<212> PRT

<213> Artificial Sequence

<220>

<223> beta-2AR mutant receptor

<400> 64

```

Cys Leu Arg Arg Ser Ser Leu Lys Ala Tyr Gly Asn Gly Tyr Ser Ser
  1      5      10      15
Asn Gly Asn Thr Gly Glu Gln Ser Gly Tyr His Val Glu Gln Glu Lys
      20      25      30
Glu Asn Lys Leu Leu Cys Glu Asp Leu Pro Gly Thr Glu Asp Phe Val
      35      40      45
Gly His Gln Gly Thr Val Pro Ser Asp Asn Ile Asp Ser Gln Gly Arg
      50      55      60
Asn Cys Ser Thr Asn Asp Ser Leu Leu Ser Ser Leu Ala Lys Asp
      65      70      75      80
Thr Ser Ser

```

<210> 65

<211> 30

<212> PRT

<213> Artificial Sequence

<220>

<223> beta-2AR mutant receptor

<400> 65

```

Cys Leu Arg Arg Ser Ser Leu Lys Ala Tyr Gly Asn Gly Tyr Ser Ser
  1      5      10      15
Asn Gly Asn Thr Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser
      20      25      30

```

<210> 66

<211> 51

<212> PRT

<213> Artificial Sequence

<220>

<223> carboxyl-terminal tail of V2R

<400> 66

```

Asn Pro Trp Ile Tyr Ala Ser Phe Ser Ser Ser Val Ser Ser Glu Leu
 1           5           10           15
Arg Ser Leu Leu Cys Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly
          20           25           30
Pro Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp
          35           40           45
Thr Ser Ser
          50

```

<210> 67
 <211> 51
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> receptor mutant

```

<400> 67
Asn Pro Trp Ile Tyr Ala Ser Phe Ser Ser Ser Val Ser Ser Glu Leu
 1           5           10           15
Arg Ser Leu Leu Cys Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly
          20           25           30
Pro Gln Asp Glu Ser Cys Thr Thr Ala Ser Ala Ala Ala Ala Lys Asp
          35           40           45
Thr Ser Ser
          50

```

<210> 68
 <211> 52
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> receptor mutant

```

<400> 68
Asn Pro Trp Ile Tyr Ala Ser Phe Ser Ser Ser Val Ser Ser Glu Leu
 1           5           10           15
Arg Ser Leu Leu Cys Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly
          20           25           30
Pro Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp
          35           40           45
Thr Ala Ala Ala
          50

```

<210> 69
 <211> 60
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> carboxyl-terminal tail of NTR-1

<400> 69

```

Asn Pro Ile Leu Tyr Asn Leu Val Ser Ala Asn Phe Arg Gln Val Phe
 1           5           10           15
Leu Ser Thr Leu Ala Cys Leu Cys Pro Gly Trp Arg His Arg Arg Lys
           20           25           30
Lys Arg Pro Thr Phe Ser Arg Lys Pro Asn Ser Met Ser Ser Asn His
           35           40           45
Ala Phe Ser Thr Ser Ala Thr Arg Glu Thr Leu Tyr
           50           55           60

```

<210> 70

<211> 60

<212> PRT

<213> Artificial Sequence

<220>

<223> receptor mutant

<400> 70

```

Asn Pro Ile Leu Tyr Asn Leu Val Ser Ala Asn Phe Arg Gln Val Phe
 1           5           10           15
Leu Ser Thr Leu Ala Cys Leu Cys Pro Gly Trp Arg His Arg Arg Lys
           20           25           30
Lys Arg Pro Thr Phe Ser Arg Lys Pro Asn Ser Ala Ser Ala Ala His
           35           40           45
Ala Phe Ser Thr Ser Ala Thr Arg Glu Thr Leu Tyr
           50           55           60

```

<210> 71

<211> 60

<212> PRT

<213> Artificial Sequence

<220>

<223> receptor mutant

<400> 71

```

Asn Pro Ile Leu Tyr Asn Leu Val Ser Ala Asn Phe Arg Gln Val Phe
 1           5           10           15
Leu Ser Thr Leu Ala Cys Leu Cys Pro Gly Trp Arg His Arg Arg Lys
           20           25           30
Lys Arg Pro Thr Phe Ser Arg Lys Pro Asn Ser Met Ser Ser Asn His
           35           40           45
Ala Phe Ser Ala Ala Ala Thr Arg Glu Thr Leu Tyr
           50           55           60

```

<210> 72

<211> 65

<212> PRT

<213> Artificial Sequence

<220>

<223> carboxyl-terminal tail of OTR

<400> 72

```

Asn Pro Trp Ile Tyr Met Leu Phe Thr Gly His Leu Phe His Glu Leu
 1           5           10           15
Val Gln Arg Phe Leu Cys Cys Ser Ala Ser Tyr Leu Lys Gly Arg Arg
           20           25           30
Leu Gly Glu Thr Ser Ala Ser Lys Lys Ser Asn Ser Ser Ser Phe Val
           35           40           45
Leu Ser His Arg Ser Ser Ser Gln Arg Ser Cys Ser Gln Pro Ser Thr
           50           55           60
Ala
65

```

<210> 73

<211> 65

<212> PRT

<213> Artificial Sequence

<220>

<223> receptor mutant

<400> 73

```

Asn Pro Trp Ile Tyr Met Leu Phe Thr Gly His Leu Phe His Glu Leu
 1           5           10           15
Val Gln Arg Phe Leu Cys Cys Ser Ala Ser Tyr Leu Lys Gly Arg Ala
           20           25           30
Ala Ala Ala Thr Ser Ala Ser Lys Lys Ser Asn Ser Ser Ser Phe Val
           35           40           45
Leu Ser His Arg Ser Ser Ser Gln Arg Ser Cys Ser Gln Pro Ser Thr
           50           55           60
Ala
65

```

<210> 74

<211> 65

<212> PRT

<213> Artificial Sequence

<220>

<223> receptor mutant

<400> 74

```

Asn Pro Trp Ile Tyr Met Leu Phe Thr Gly His Leu Phe His Glu Leu
 1           5           10           15
Val Gln Arg Phe Leu Cys Cys Ser Ala Ser Tyr Leu Lys Gly Arg Arg
           20           25           30
Leu Gly Glu Thr Ser Ala Ala Ala Ala Ser Asn Ser Ser Ser Phe Val
           35           40           45
Leu Ser His Arg Ser Ser Ser Gln Arg Ser Cys Ser Gln Pro Ser Thr
           50           55           60
Ala
65

```

<210> 75

<211> 65

<212> PRT

<213> Artificial Sequence

<220>

<223> receptor mutant

<400> 75

```

Asn Pro Trp Ile Tyr Met Leu Phe Thr Gly His Leu Phe His Glu Leu
 1           5           10          15
Val Gln Arg Phe Leu Cys Cys Ser Ala Ser Tyr Leu Lys Gly Arg Arg
          20           25          30
Leu Gly Glu Thr Ser Ala Ser Lys Lys Ser Asn Ser Ser Ser Phe Val
          35           40          45
Leu Ser His Arg Ala Ala Ala Gln Arg Ser Cys Ser Gln Pro Ser Thr
          50           55          60
Ala
65

```

<210> 76

<211> 105

<212> PRT

<213> Artificial Sequence

<220>

<223> carboxyl-terminal tail of SPR

<400> 76

```

Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe
 1           5           10          15
Lys His Ala Phe Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu
          20           25          30
Gly Leu Glu Met Lys Ser Thr Arg Tyr Leu Gln Thr Gln Gly Val Tyr
          35           40          45
Lys Val Ser Arg Leu Glu Thr Thr Ile Ser Thr Val Val Gly Ala His
          50           55          60
Glu Glu Glu Pro Glu Gly Pro Lys Ala Thr Pro Ser Ser Leu Lys Leu
65          70          75          80
Thr Ser Asn Cys Ser Ser Arg Ser Asp Ser Lys Thr Met Thr Glu Ser
          85          90          95
Phe Ser Phe Ser Ser Asn Val Leu Ser
          100         105

```

<210> 77

<211> 66

<212> PRT

<213> Artificial Sequence

<220>

<223> receptor mutant

<400> 77

```

Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe
 1           5           10          15
Lys His Ala Phe Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu
          20           25          30
Gly Leu Glu Met Lys Ser Thr Arg Tyr Leu Gln Thr Gln Gly Val Tyr

```

```

      35              40              45
Lys Val Ser Arg Leu Glu Thr Thr Ile Ser Thr Val Val Gly Ala His
      50              55              60
Glu Glu
65

```

<210> 78
 <211> 44
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> receptor mutant

```

<400> 78
Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe
  1              5              10              15
Lys His Ala Phe Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu
              20              25              30
Gly Leu Glu Met Lys Ser Thr Arg Tyr Leu Gln Thr
      35              40

```

<210> 79
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> receptor mutant

```

<400> 79
Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe
  1              5              10              15
Lys His Ala Phe
              20

```

<210> 80
 <211> 69
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> receptor mutant

```

<400> 80
Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe
  1              5              10              15
Lys His Ala Phe Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu
              20              25              30
Gly Leu Glu Met Lys Ser Thr Arg Tyr Leu Gln Thr Ala Ala Val Ala
      35              40              45
Ala Val Ser Arg Leu Glu Thr Thr Ile Ser Thr Val Val Gly Ala His
      50              55              60
Glu Glu Glu Pro Glu

```


65

<210> 81

<211> 68

<212> PRT

<213> Artificial Sequence

<220>

<223> receptor mutant

<400> 81

Asn	Pro	Ile	Ile	Tyr	Cys	Cys	Leu	Asn	Asp	Arg	Phe	Arg	Leu	Gly	Phe
1				5					10					15	
Lys	His	Ala	Phe	Arg	Cys	Cys	Pro	Phe	Ile	Ser	Ala	Gly	Asp	Tyr	Glu
		20						25				30			
Gly	Leu	Glu	Met	Lys	Ser	Thr	Arg	Tyr	Leu	Gln	Thr	Gln	Gly	Val	Tyr
		35					40				45				
Lys	Val	Ser	Arg	Leu	Glu	Thr	Thr	Ile	Ser	Thr	Val	Ala	Gly	Ala	Ala
	50					55					60				
Glu	Glu	Glu	Pro												

<210> 82

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> amino acid motif

<221> VARIANT

<222> 3, 4

<223> Xaa = Any Amino Acid

<400> 82

Asn	Pro	Xaa	Xaa	Tyr
1				5